

Ever since the first nuclear weapon was built in 1945, nuclear war has been a threat. The two major nuclear powers in the world today are the Soviet Union and the United States. If a war ever broke out between the two, which involved the use of nuclear weapons, the whole world would suffer from the effects. In this report I am going to prove that nuclear weapons are a threat to all of us.

A nuclear weapon is any device that causes an explosion by the release of the energy in an atom.

They are much more powerful than any conventional or "non nuclear" weapons.

Nuclear weapons are divided

into two groups: fission weapons, which are often called atom bombs, and

thermonuclear or fusion weapons,

which are often called hydrogen bombs because that is what they are made of.

FISSION WEAPONS

Fission weapons cause an explosion by the splitting of atomic nuclei. This happens when a neutron collides with the nucleus of an atom. The protons in the nucleus are transformed into a great amount of energy and two or three more neutrons are sent out, which go on to split other nuclei. If this continues a process called a chain reaction will occur. When this happens a fission explosion is the result. To form a chain reaction, a certain amount of material is needed. This amount is known as the critical mass. If the amount is too small it is known as a subcritical mass. The critical mass of a material depends on its purity. The materials used in making fission weapons are uranium and plutonium. They are the only elements able to be used in making a fission weapon.

There are two different ways to make a fission weapon: the gun-type method and the implosion method. In the gun-type method, two pieces of material, each having a subcritical mass, are placed at opposite ends of a metal cylinder. One of the pieces has a powerful, nonnuclear explosive behind it that explodes on impact and drives the piece into the one at the other end. The atoms in the material collide and start a chain reaction. In the implosion method a ball of either uranium or plutonium is surrounded by a large amount of nonnuclear explosive. When triggered it compresses the nuclear material, which also causes a chain reaction.

FUSION WEAPONS

Thermonuclear or fusion weapons get their destructive power from the combining of light atoms.

Hydrogen, the lightest element, is used in making fusion weapons. When the atoms of the element fuse, they

release a great amount of energy. The only problem is that the element must be heated to a temperature of 50

million degrees Celsius. The only way to do this, without using more energy than is produced, is to use a

fission explosion. So, a ball of hydrogen is surrounded by either uranium or plutonium and then by a non

nuclear explosive. When the explosive is set off it causes the uranium or

plutonium to fission, which in turn causes the hydrogen to fuse.

HISTORY

In 1939, the U.S. government became concerned that the Nazi Germans may be capable of building a nuclear weapon, so upon joining World War II, the United States began a secret operation called the Manhattan Project to build their own nuclear weapon. The first experimental nuclear weapon was exploded on July 16, 1945, by J. Robert Oppenheimer. It was a 22 kiloton implosion-type device. This test convinced the U.S. government that nuclear weapons could be used in war. On August 6, 1945, the United States used the first nuclear weapon on the Japanese city of Hiroshima. It was a 13 kiloton gun-type fission bomb. Three days later, the United States dropped a 22 kiloton implosion-type fission bomb on another Japanese city called Nagasaki. On August 14, eight days after the first bomb was dropped, the Japanese surrendered, which brought an end to World War II.

EFFECTS

The three main effects that would follow a nuclear explosion are blast, thermal radiation or heat, and radiation. The very first thing to happen is the formation of a fireball. The fireball gives off the thermal radiation that vaporizes anything within a quarter mile and ignites flammable materials within ten miles. The thermal radiation can cause eye injuries as well as skin burns called flash burns. Between 20 and 30 per cent of the deaths at Hiroshima and Nagasaki were caused by flash burns. When the fireball begins to dissipate it forms a blast wave that travels away from the explosion at speeds up to 400 miles per hour. This destroys most buildings within 6 miles. It also kills most people within 3 miles and severely injures or kills most people up to 6 miles away. Then comes the radiation. It is made up of neutrons that were left over after the explosion. When these neutrons come in contact with living cells they damage or even destroy them. A person exposed to large amounts of radiation will usually die.

Some scientists believe that the debris and smoke from the fires after a nuclear war would cause a worldwide cooling of the planet, which is known as a nuclear winter. For this reason, the nations at war would not be the only ones to suffer.

